

AQA Level 3 Foundation Technical Level Engineering

Why study Engineering at The Sixth Form at Ridgewood?

- Studying Engineering at Technical Level 3 will enable you to look more closely at the scientific principles used by engineering to identify the most suitable materials in a given engineering context. You will learn about the use of mechanical engineering systems and components, applying these to the process of engineering design and research in the relevance and role that manufacturing processes and systems have in the production of multiple components.
- This course will provide you with the knowledge, understanding and skills needed for progression into employment or further study within engineering.
- Former students of the Engineering department at Ridgewood have gone on to study and pursue careers in mechanical engineering, general engineering and electronic engineering.
- We have rich and wide-ranging resources from a heat treatment room that is dedicated to Engineering to a STEM laboratory in our sixth form building.
- We have two specialist Engineering and Electronics teachers who will support you throughout the course, alongside an Engineering and Electronics specialist teaching assistant who works closely with our teachers to provide additional support for our students.
- We also work closely with local engineering companies to enhance the experience of our students and demonstrate real life engineering environments.

What topics will I study in this subject?

Topic	What this means
Materials, Technology and Science	<p>In this unit you will develop an understanding of the materials used in engineering products and the scientific principles engineers use to identify which materials are the most suitable for use in a given engineering context.</p> <p>In particular, you will develop knowledge of properties of materials, engineering materials, engineering chemistry, electricity and electronics and transfer of energy.</p>
Mechanical Systems	<p>In this unit you will look at how mechanical systems are used to carry out tasks that involve forces and movement. This involves developing understanding of power sources that generate force and movement, functional elements that change the magnitude or direction of this force or movement, the means of transmitting this force or movement to where it is required and some form of control system.</p> <p>You will look at how these systems are designed, and how they function. You will also assemble and test mechanical systems and how they need to be maintained.</p>
Engineering Design	<p>This unit sees you using your creative side in applying the knowledge and application of technical and scientific skills and of materials to solve an engineering problem. This unit will demonstrate the key skills and knowledge required to be a design engineer. It will assess your understanding of the engineering design process and using industry standard tools and techniques to produce engineering design.</p>
Production and Manufacturing	<p>In this unit, you will develop knowledge and understanding of a range of manufacturing processes and use these processes to plan and manufacture a batch of products. In particular, you will develop knowledge of manufacturing processes, engineering manufacturing systems, quality control and quality assurance, engineering production planning, and how to carry out these production processes.</p>

What skills will I need in this subject?

Skill	What this skill involves in this subject
Analysis	In Engineering, your lessons and independent study work will involve analysis. This means you will be given data and information that you will need to research, and you will be required to write at length about your findings. You will need to give detailed explanations and justify your choices.
Solving engineering problems	As part of your coursework you will be expected to use problem-solving skills. You will be presented with a number of problems. You will be expected to research and find a number of creative engineering solutions to the problems presented and then justify your decisions on your solution.
Computer Aided Design	In your lessons and independent study time you will be expected to develop and use Computer Aided Design skills. You will have to apply these in developing engineering designs.

What will my lessons involve?

<ul style="list-style-type: none"> • We will discuss key terminology and identify areas that you must independently research. • In theory lessons, you will listen to key information about a topic area and create sets of notes to support your coursework or revision for the exam. • You will conduct independent research using a variety of sources including internet-based engineering resources, reports, statistical data and websites, and the wealth of engineering books, guides and specification catalogues we have available in the Sixth Form. • A large proportion of lessons will be spent completing coursework in controlled assessment conditions. Some of this time will be spent researching a variety of sources as well as completing extended writing tasks and practical application of skills. • You will also complete training on Solid Edge CAD software in order to be able to use this throughout your coursework. •
--

What will my independent study involve?

<ul style="list-style-type: none"> • In order to gain the highest grades in the exam you must complete at least one hour of independent study for every lesson. During these sessions you are expected to produce revision resources that will prepare you for the exams. • In class you will have identified your gaps in knowledge so it will be clear which areas you need to work on. Examples of this are creating mind maps, creating revision flash cards and self-quizzing. • You may also have to complete work collaboratively such as completing a group presentation on a given area of the exam. • You will be expected to practise your CAD skills and develop your understanding of the Solid Edge software package. • For coursework, your independent study will involve research and exploration of areas related to the content and scenario presented in the assignment brief.

How will I be assessed?

Percentage exam assessment: 25%	Percentage coursework assessment: 75%
---------------------------------	---------------------------------------

Assessment	Details of assessment
Unit 1: Materials, Technology and Science	<p>External assessment written exam, 1 hour 45 minutes, 25% of the overall mark.</p> <p>Topics covered are properties of materials, engineering materials, engineering chemistry, electricity and electronics and transfer of energy. There are some multiple choice and short answers and extended answers throughout the paper.</p> <p>Exam is taken in the summer of Year 12.</p>

Unit 2: Mechanical Systems	Externally set and externally assessed task, 20 hours, 25% of the overall mark. A written and practical task set and marked by the exam board and completed under supervised controlled assessment conditions.
Unit 4: Engineering Design	Internal assessment coursework, worth 25% of the overall mark. The assignment brief is written, set and marked by Ridgewood and externally verified by the exam board.
Unit 5: Production and Manufacturing	Internal assessment coursework, worth 25% of the overall mark. The assignment brief is written, set and marked by Ridgewood and externally verified by the exam board.

How do I know this is the right course for me?

- You will be a strong independent learner who can analyse and decimate written and numerical information accurately.
- You will relish the challenges of researching, conducting and analysing data from practical investigations.
- You will enjoy working collaboratively and if you prefer a combination of coursework and exam.
- One of the challenges is time management as there are lots of deadlines and managing both coursework and exam content at the same time can be difficult. It is important that you plan from the very beginning of the course your independent study time in school and at home so that you have a clear plan of when you will complete work. This is especially important if your combination of subjects means that you have other coursework to complete.
- You need to be keen to broaden your knowledge of engineering applications or be interested in studying an engineering related degree at university. It is important that you choose the correct combination of subjects to progress to an Engineering degree as maths and physics are often required.

